Blyth Drinking Water System – 2023 Compliance Summary

This document is a compliance summary for the Blyth water supply for the year 2023 as per Reg. 170/03 Schedule 22. A full summary of the water system's test results, flows and significant activities was submitted on February 5, 2024.

System Description

The Blyth Drinking Water System (DWS # **220001496**), is characterized as a "secure ground water" system and is classified as a large municipal residential system. The system consists of three wells (1, 2 and 5) with a rated capacity of 2877 m3/day with the inclusion of Well 5 (1728 m3/d), put in operation December 21, 2016. Treatment consists of chlorination (sodium hypochlorite) and iron sequestration (sodium silicate) treatment. The Well 1 and 2 system is located at 201 Thuell St. Well #5 is located in the north east corner of 377 Gypsy Lane. The distribution system serves the community of Blyth with a population of approximately 1000 residents, 450 customer services, with 12.7 km of various size and material water main.

The system is owned by the Corporation of the Township of North Huron and operated by Veolia Water Canada, the Operating Authority.

The Wells 1 and 2 water supply system consists of two drilled wells fitted with pumps capable of pumping the volume specified in the MOE Permit to Take Water. The raw water consistently has substantial naturally occurring hardness and relatively high iron content that requires sequestering to prevent discoloration in the distribution system which is typical of all drilled wells in the area. The raw water also has fluoride concentrations that hover at or just above the maximum allowable concentration in O.Reg 169/03 which is typical of the drilled wells in the area. Chlorine, (a critical process) and an iron sequestering agent are added to the raw water prior to entry into a baffled contact tank that satisfies the chlorine contact time required with adequate chlorine residual to disinfect.

From the contact tank/reservoir the water flows to the high lift building that houses two electrically driven high lift pumps, as well as a diesel engine driven fire pump, that are capable of maintaining adequate system pressure. The water level in the reservoir is maintained by a level controller that starts and stops the well pumps. Also housed in the building is a manually operated standby emergency generator that allows operation of the equipment during extended power interruptions. The building contains cushion tanks that absorb hydraulic shocks and maintain pressure during brief power interruptions. The treated drinking water is monitored for chlorine residual and turbidity by on-line equipment connected to an auto dialer. The monitoring system will alert the on-call operator to respond if the set points are breached. The chlorine and turbidity analysis data levels are stored on a data logger.

The distribution system has no elevated storage and relies on the pumps and cushion tanks to maintain pressure. Critical processes to ensure safe water are adequate chlorination and maintenance of system pressure. The monitors activate an alarm through the auto dialer if the set points are breached.

The raw water has abnormally high chlorine demand, coupled with sequestering agent and high background sodium levels that result in elevated sodium in the treated water just above the maximum allowable concentrations in O.Reg 169/03.

Well # 5 was put into service in December 21, 2016, as a second isolated source. It is a 175 mm drilled well; 83.5 m deep. Well # 5 is equipped with a submersible vertical turbine pump, well level sensor to measure static level and provide well level monitoring. At this stage of development of the system (phase 1 of 3), Well 5 has been designed to operate on a time-of-day basis to run twice per day during peak demand times and controlled with a variable speed drive to maintain the desired pressure set point in the distribution system as well as to provide additional volume of water during periods of high-water demand such as fire protection.

The well house is equipped with back-up diesel generator, complete with auto transfer, sodium hypochlorite (2) and sodium silicate (2) pumps, a chlorine contact loop, on-line monitoring, alarm generation and auto-dialer.

The well house and its equipment have a daily rated capacity to deliver 1728 m3 per day to the Blyth community.

The water from Well 5 is pumped through a main header where sodium hypochlorite and sodium silicate are added and directed to a chlorine contact loop to provide adequate chlorine concentration/contact time at maximum flow and before the first consumer.

The water quality is monitored and data-logged by a programmable logic controller with breaches of set-points going to an alarm dialer.

Disinfection is achieved on the Blyth well supply through the use of 12% sodium hypochlorite. In the well houses this chemical is added prior to the water entering the chlorine contact reservoir at a suitable dose rate to achieve both primary and secondary disinfection objectives.

The attached distribution system is constructed with a combination of ductile iron, cast iron, PVC and high-density polyethylene piping with polyethylene, copper and galvanized steel services. There are no known lead services.
There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks, 3 high lift pumps (2 electric and a diesel) and 1 variable speed submersible (Well 5).

The system has approximately 45 fire hydrants that with the additional 20L/s flow from Well 5 will provide much improved sustained fire flows.

The chlorine dosage range varies with the chlorine demand of the raw water.
The free chlorine residual is monitored at the point of entry to the distribution system, by an on-line chlorine analyzer, with a target residual of > 1.00 mg/l and < 1.30 mg/l.

The Blyth well supply has 1 PTTW (Permit to Take Water) # 6057-A3SJAU with an expiry date of November 30, 2025, which allows 3504.960 cubic meters per day to be pumped from the combined wells.

The Blyth Drinking Water System (treatment Subsystem) has rated capacity as specified in the Municipal Drinking Water License (MDWL) 090-101, Issue 3 and Drinking Water Works Permit (DWWP) 090-201), Issue 4. The rated capacity is 2877 cubic meters per day. Authorization to operate Well 5 is in a Form C addendum to the DWWP. Well 5

The pre-chlorine entering the contact facilities and treated water (point of entry to distribution) is monitored by on-line chlorine analyzers.

Typical system pressure ranges from 40 psi at the higher elevations to 85 psi at Wells 1 and 2 which is the lowest elevation of the system. Well 5 system pressure ranges between 53psi to 65psi under normal operating conditions

Flows

The Blyth well supply has 1 PTTW (Permit to Take Water) # 6057-A3SJAU with an expiry date of November 30, 2025, which allows 3504 cubic meters per day to be pumped from the combined wells.

The Blyth Drinking Water System (treatment Subsystem) has maximum flows as specified in the Municipal Drinking Water License (MDWL) 090-101, Issue 4 and Drinking Water Works Permit (DWWP) 090-201), Issue 5. The Rated Capacity per day is 3504 cubic meters from the combined wells. Authorization to operate Well 5 is in a Form C addendum to the DWWP. Well 5

The maximum daily flow in 2023 was 1336 cubic meters or 38.1% of capacity.
The 2023 average daily flow was 470 cubic meters or 13.4% of the capacity

Permit to Take Water 6057-A3SJAU Compliance Report					
3.2 -Maximum Amount of Taking Permitted					
	Max/Day on Permit		Peak Flow	%of Limit	
Well #1 (in m3)	653	m3	314	48.1	%
Well #2 (in m3)	1123	m3	355	31.6	%
Well #5 (in M3)	1728	m3	667	38.6	%
3.2 - Average Annual Amount of Taking Permitted					
	m3/year		m3/year		
Well #1 (in m3)	238345		48681	20.4	%
Well #2 (in m3)	409968		49636	12.1	%
Well #5 (in M3)	630720		73217	11.6	%

Capacity Report					
Total Peak Flow and average daily flow of all wells combined					
	Maximum		Actual	%of Cap	
Capacity (m3/d)	3504		1336	38.1	%
Average Daily flow (m3/Day)	3504		470	13.4	%

Precautionary Boil Water Notices
There were no Precautionary Boil Water Notices Issued in 2023.

Boil Water Advisory
There were no Boil Water Advisories issued by the Huron County Health Unit for the Blyth Drinking Water system in 2023.

Annual Ontario Ministry of the Environment Conservation and Parks Inspection
The most recent Ministry of Environment inspection was completed by Shayne Finlay on August 16, 2023.

There were no non-compliances noted and the inspection rating was 100%

Adverse Water Quality Indicators
AWQI# 162807- Total Coliform on a Distribution sample result of 1 when the MAC is 0- resamples collected resulted in a clear result

Treated water Fluoride and Sodium samples are to be collected every 5 years Blyth Historically has elevated levels of Sodium and Fluoride- due to this knowledge of the naturally occurring levels in the drinking water we do an annual sample on the raw water for monitoring purposes. Treated Water Samples were collected on January 10, 2023 and resulted in 3 Adverse Water Quality Indicators being issued, details are below;

AWQI# 161149 Treated water Fluoride: Exceeded the MAC of 1.5mg/L with a result of 1.66mg/L the resample result confirmed the adverse Fluoride results with a result of 1.69mg/L- The Huron Perth Public Health Unit sent out Notifications and Information to all water users in the Blyth System

AWQI# 161169 & AWQI 161167 Treated Water Sodium: Well 1&2 POE 25.2mg/L, well 5 POE 25.2mg/L both exceeding the MAC, resamples were collected on January16, 2023. The resample results were; Well 1&2 POE: 24mg/L, Well 5 POE: 25.2mg/L. Both still exceeding the 20mg/L MAC. The Huron County Health Unit provided the Township of North Huron with a Notification to be distributed to all water system users.

pH, Alkalinity & Lead

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15 and once between June 15 and October 15. The Maximum Allowable Concentration for Lead is 10 ug/L. In 2023 Samples for Alkalinity and pH were collected on March 20th and October 3rd, all results were within the acceptable limits, due to being on a reduced sample schedule for Lead the parameter is not required to be sampled for until 2025 every 3 years it was sampled for in 2022. The samples collected in 2022 were within Compliance limits.

Exceedances

Aside from the listed AWQI's there were no exceedances in the System in 2023

Infrastructure Assessment

Regular contact is maintained with the Township of North Huron Representatives. The Jobs-Plus maintenance program is continually updated with preventative and corrective maintenance activities. A complete summary can be forwarded to the client upon their request. Through regular communication between the operating authority and the client, capital items are discussed. A list of capital suggestions and projects was forwarded to North Huron' representatives on October 28, 2022 for the Operating year 2023. The Township also has a asset management program and Financial Plan which ensures long term capital planning for the Water system

DWQMS

The annual Management Review was conducted by the operating authority on November 15, 2023 as per the DWQMS requirement in Element 20, The Management Review Report and Action Items were forwarded to the Owner on Dec 8, 2023. These regular discussions between the client and the operating authority for this water system are continued throughout the year by emails, phone calls, and meetings as per the requirements of Element 15 of the DWQMS.

The Internal Audit was completed Dec 11-12, 2023 and the annual Risk Assessment Review was completed October 23, 2023.

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